

## REMARKS

### I. OVERVIEW

Claims 1-52 are pending in the present application. The present response is an earnest attempt to advance the application to allowance. Reconsideration is respectfully requested.

### II. ELECTION/RESTRICTION REQUIREMENT

Applicant gratefully acknowledges the finding by the Patent Examiner that the prior restriction requirement, requiring the application be split into plural applications, has been withdrawn and that all claims are retained in the present application.

### III. §102 REJECTIONS

Claims 1-24 and 27-52 stand rejected as anticipated under 35 U.S.C. § 102(b) on the basis of Whitten U.S. Patent No. 6,732,014 ("Whitten"). This rejection is respectfully traversed.

Whitten does disclose an optical system to monitor for vended products that utilizes a set of emitters and a corresponding set of detectors on opposite sides of the delivery path for the vendible products. However, Whitten does not anticipate Applicant's claimed inventions because of the following.

1. *Claims 1, 20, 30, 40, and 50 –Limitation of All Detectors Monitoring Each Time a Single Emitter is Turned On.*

First, each of Applicant's independent claims 1, 20, 30, 40, and 50 describes the specific regimen of sequentially turning a single emitter on and then checking to see if all detectors are on or not. In Applicant's preferred embodiment, this means that each time a single emitter is turned on, detectors on the opposite side of the vending machine are checked to see if they sense the energy from that single emitter. Applicant's specification describes this feature or aspect of the invention. See for example Applicant's specification page 7, lines 3-10 and page 25, lines 12-18. When each emitter is on, a check is made whether or not all detectors are on.

In contrast, Whitten discloses its preference is to have a subset of all the detectors monitors a single corresponding emitter. Although Whitten makes some statements that three or

more detectors could monitor a single emitter, it discloses and teaches that subsets of emitter/detectors be operated at sequential times. It does not state that all the detectors be monitored. See the following excerpts from Whitten (emphasis added):

See Whitten column 4, lines 19-67:

**In step 410 an emitter pulses its signal to the corresponding detector across from the emitter, and the two detectors on either side of the detector.** Upon pulsing the light, the detector circuitry determines whether the detectors detected the light from the emitter in step 415. (If the emitter is either the first emitter or the last emitter on the emitter arm, then **only the detector across from the emitter and the detector on the non-wall side of the detector is scanned.**)

**If the detector directly across from the pulsing emitter or the side detectors detects the signal in 415,** then the emitter's logic circuit sequences to the next emitter in line and sends a pulse from that emitter in step 420. The emitter's logic circuit continues until after it completes the pulsing of the last detector whereupon, the monitoring system repeats the process, begins again at the first emitter until the detector's logic circuit receives a detect signal and the monitoring system receives a signal to cease monitoring.

**If at least one of the three detectors fails to detect a light beam from the emitter during the monitoring cycle, then the logic circuit reports a product delivery to the ordering system in step 425.** Once a report of delivery is made to the ordering system, the ordering system returns a signal to the monitoring system to return to steady state calibration mode in step 430. Otherwise, the monitoring system continues to monitor until it receives a return to steady state calibration signal from the ordering system because of a refund, if appropriate.

See also, Whitten Col. 4, line 58 to Col. 5, line 25

The calibration mode adjusts the light intensity from each emitter as necessary **so that each set of three detectors serviced by that emitter** receives only enough intensity, plus a small safety margin, to be active in the unblocked condition. This minimizes the adverse affects of reflected light from the emitters and allows for a wider detector aperture (which makes system alignment easier) and reduces the overall power requirements of the system. In step 505, the logic circuit in the monitoring system determines whether an order has been placed. If an order has not been placed, then the monitoring system proceeds to send a series of pulses to the first of the one or more emitters in step 510. Upon sending a pulse, **the monitoring system queries the emitter's corresponding detector and each detector on either side of the corresponding detector to determine if those detectors detected the pulsed signal in step 515.** If a signal was detected in each of the three detectors then the monitoring circuitry sequences

to the next emitter in step 520. The emitter's typically have adjustable signal power levels associated with the type of emitter used. The calibration mode will attempt to maintain the power level at the level needed to provide just enough signal, plus a safety margin, such that the corresponding detectors detect the signal. If any one of the three detectors does not detect the pulsed signal from the emitter, then in step 530, the monitoring circuitry determines whether the emitter is operating at its maximum power intensity. If the emitter is not, then the emitter will step increase the signal power level in step 560 and re-send a pulsed signal to the detectors again in step 510. If the power intensity for that emitter is at its maximum intensity, then the detector will send an error message to the monitoring system in step 540. The monitoring system will then follow a precoded routine to shut down the entire vending operation, shut down the monitoring system or rely on prior art ordering systems (the home switch method) in step 550.

See also Whitten Col. 5, lines 26-47:

**As mentioned above, product detection may be accomplished by utilizing infrared emitter/detector pairs that can monitor and detect when a signal path is broken. In typical a vending machine's delivery paths, a set of ten infrared emitter/detector pairs are used to cover the delivery path much like a light curtain.**

See also Whitten, Col. 5, lines 55-65:

FIG. 7 shows a representative example of a light curtain 730 that may be utilized in the present invention. Typically, **nine sets of emitters/detectors are used to cover the main delivery path, while the tenth set is used to cover a gum/mint area. The nine sets that cover the main delivery path implement a technique, which, other than for the first and last emitter, requires that, a minimum of three detectors are active for each individual emitter monitor cycle. For those vending machines without a gum or mint section, the tenth emitter may be used for the main delivery area, provided that proper alignment of the ten sets is taken into consideration.**

See Whitten, Col. 5, line 66 to Col. 6, line 18.

This arrangement is illustrated in FIG. 7, which shows the light beams 710 of interest for each emitter 720 and detector 725. The spacing of the emitter/detector sets are chosen to assure that the smallest size traditional product breaks the path of at least one beam when it crosses the light curtain during delivery. **The technique of servicing three detectors for each emitter, allows the monitor to read multiple light beams, which further reduces this spacing in the majority of the delivery area.** A logic circuit determines whether a light beam has been broken.

See Whitten, Col. 6, lines 9-19:

In the monitoring system, the **infrared emitter/detector sets** are controlled by a

microcontroller located on the detector arm. During the monitoring mode, **it is necessary to monitor each of the emitter/detector sets separately because of the potential for light bleed-over from adjacent emitters.** The timing sequence for each set monitor cycle used during the monitoring mode must be fast enough to ensure that the smallest product will be detected by any one of the detectors when the product passes the monitor plane as it falls from the product storage area.

Thus, Whitten teaches away from monitoring all detectors. See, *supra*.

Therefore, this distinction between Whitten and Applicant's independent claims differentiates Applicant's claims from Whitten. There is not a *prima facie* case of anticipation. Anticipation requires a single prior art reference contain all material limitations of a claim. Whitten does not disclose having all the detectors watch for light from each emitter. Whitten gives a specific reason why it discloses monitoring of subsets of detectors for each cycle of emitters.

2. *Claims 1, 20, 30, 40, and 50 –Limitation of All Emitters Are Off For Predetermined Time Period Between Each Emitter On.*

Secondly, each independent claim includes the limitation that all emitters are off for a time period between the sequential firing of individual emitters. This is described throughout Applicant's specification (*see, e.g.*, Page 32, lines 19-20 and Figure 5, step 208).

In contrast, Whitten repeatedly describes an immediate sequencing between emitters:

See the following excerpts from Whitten (emphasis added):

Whitten, column 4, lines 19-67:

If the detector directly across from the pulsing emitter or the side detectors detects the signal in 415, then **the emitter's logic circuit sequences to the next emitter in line and sends a pulse from that emitter in step 420. The emitter's logic circuit continues until after it completes the pulsing of the last detector whereupon, the monitoring system repeats the process, begins again at the first emitter until the detector's logic circuit receives a detect signal and the monitoring system receives a signal to cease monitoring.**

See Whitten, Col. 6, lines 9-19:

In the monitoring system, the infrared emitter/detector sets are controlled by a microcontroller located on the detector arm. During the monitoring mode, it is necessary to monitor each of the emitter/detector sets separately because of the potential for light bleed-over from adjacent emitters. **The timing sequence for each set monitor cycle used during the monitoring mode must be fast enough to ensure that the smallest product will be detected by any one of the detectors when the product passes the monitor plane as it falls from the product storage area.**

3. *Claims 1 and 20—Limitation of Monitoring All Detectors For Malfunction When All Emitters Are Off.*

Third, Applicant's independent claims 1 and 20 have a further limitation that is not disclosed in Whitten. Claims 1 and 20 specifically describe turning all emitters off for a given time period and checking to see if any of the detectors report an "on" state. This explicit step (step (c) in Applicant's claim 1 and step (c) in Applicant's claim 20) gives a second check for correct operation of the detectors. As described in Applicant's specification page 7, lines 11-15 and page 23, line 5 through page 24, line 19, if any detector indicates an "on" condition when no emitter is on, the assumption will be made that a detector is malfunctioning. This would allow continuous checking of all the detectors of the system to avert "falsing". As described in Applicant's specification, it is a specific option to try to better know if the optical sensing system is operating properly.

Whitten has no such disclosure. Whitten does perform a calibration. However, it relates to adjusting the intensity of the emitters. Nothing in Whitten is seen as disclosing step (c) of Applicant's claim 1, and its analogous provisions in step (c) of claim 20 which test operation of the detectors.

The benefit of this specific function in Applicant's claims 1 and 20 is that it can avoid an improper double vend. If the detectors turn on even if they do not "see" the light from the emitters, the vending machine might try to vend a second product based on an assumption that the customer's selected product did not drop.

For these reasons, it is additionally submitted that independent claims 1 and 20 are not anticipated by Whitten and a prima facie case of anticipation is not shown by Whitten as to those claims.

Claims 2-19 and 21-24, 27-29, 31-39, 41-49, and 51 and 52 are dependent from the independent claims discussed above and are submitted to be allowable for the reasons expressed in support of the independent claims.

Other aspects of some of the dependent claims are not anticipated by Whitten but because of the lack of material limitations described above, the dependent claims are submitted to be patentable over Whitten on at least those grounds.

#### IV. § 103 REJECTIONS

Claims 25 and 26 stand rejected as obvious under 35 U.S.C. § 103(a) on the basis of Whitten. The Examiner takes the position the specific spacing of the emitters or detectors would be an obvious design choice. This rejection is respectfully traversed.

However, Claims 25 and 26 are dependent on independent claim 20. Whitten does not disclose, nor does it teach or suggest, the material limitations described in the preceding section that are explicitly set forth in Applicant's independent claim 20. Therefore, it is respectfully submitted Whitten does not support a prima facie case of obviousness of claims 25 and 26 for those reasons alone. It is respectfully submitted that those claims are allowable over Whitten.

#### V. CONCLUSION

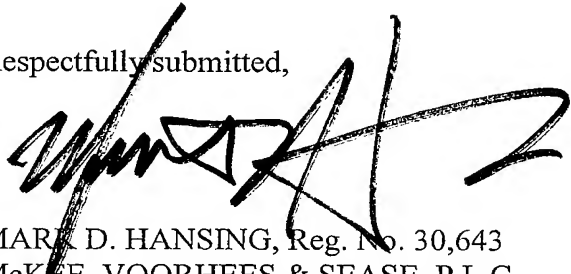
It is respectfully submitted all matters raised by the Office Action have been addressed and remedied and that the application is in form for allowance.

This is a request under the provision of 37 CFR § 1.136(a) to extend the period for filing a response in the above-identified application for three months from October 17, 2006 to January 17, 2007. Applicant is a small entity; therefore, please charge Deposit Account No. 26-0084 in the amount of \$510.00 to cover the cost of three months extension. Any deficiency or

overpayment should be charged or credited to Deposit Account 26-0084. It is not believed that any additional fees or petitions for extension of time are required for entry of this response but if any have been inadvertently overlooked, please consider this a request therefore and charge any required fee to Deposit Account No. 26-0084.

Reconsideration is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Mark D. Hansing', written over the text 'Respectfully submitted,'.

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